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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/519,743	08/25/2005	Sergio Debernardi	9526-47 (161023)	9279
30448	7590	07/29/2010	EXAMINER	
AKERMAN SENTERFITT			WU, IVES J	
P.O. BOX 3188			ART UNIT	
WEST PALM BEACH, FL 33402-3188			PAPER NUMBER	
			1797	
			NOTIFICATION DATE	
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			07/29/2010	
			ELECTRONIC	

Please find below and/or attached an Office communication concerning this application or proceeding.

The time period for reply, if any, is set in the attached communication.

Notice of the Office communication was sent electronically on above-indicated "Notification Date" to the following e-mail address(es):

ip@akerman.com

Office Action Summary	Application No. 10/519,743	Applicant(s) DEBERNARDI, SERGIO	
	Examiner IVES WU	Art Unit 1797	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 02 June 2010.
- 2a) ☒ This action is **FINAL**. 2b) ☐ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1-10 is/are pending in the application.
- 4a) Of the above claim(s) _____ is/are withdrawn from consideration.
- 5) ☐ Claim(s) _____ is/are allowed.
- 6) ☒ Claim(s) 1-10 is/are rejected.
- 7) ☐ Claim(s) _____ is/are objected to.
- 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on _____ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some * c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
 2. ☐ Certified copies of the priority documents have been received in Application No. _____.
 3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

- | | |
|---|---|
| 1) <input type="checkbox"/> Notice of References Cited (PTO-892) | 4) <input type="checkbox"/> Interview Summary (PTO-413) |
| 2) <input type="checkbox"/> Notice of Draftperson's Patent Drawing Review (PTO-948) | Paper No(s)/Mail Date. _____ |
| 3) <input type="checkbox"/> Information Disclosure Statement(s) (PTO/SB/08) | 5) <input type="checkbox"/> Notice of Informal Patent Application |
| Paper No(s)/Mail Date _____ | 6) <input type="checkbox"/> Other: _____ |

DETAILED ACTION

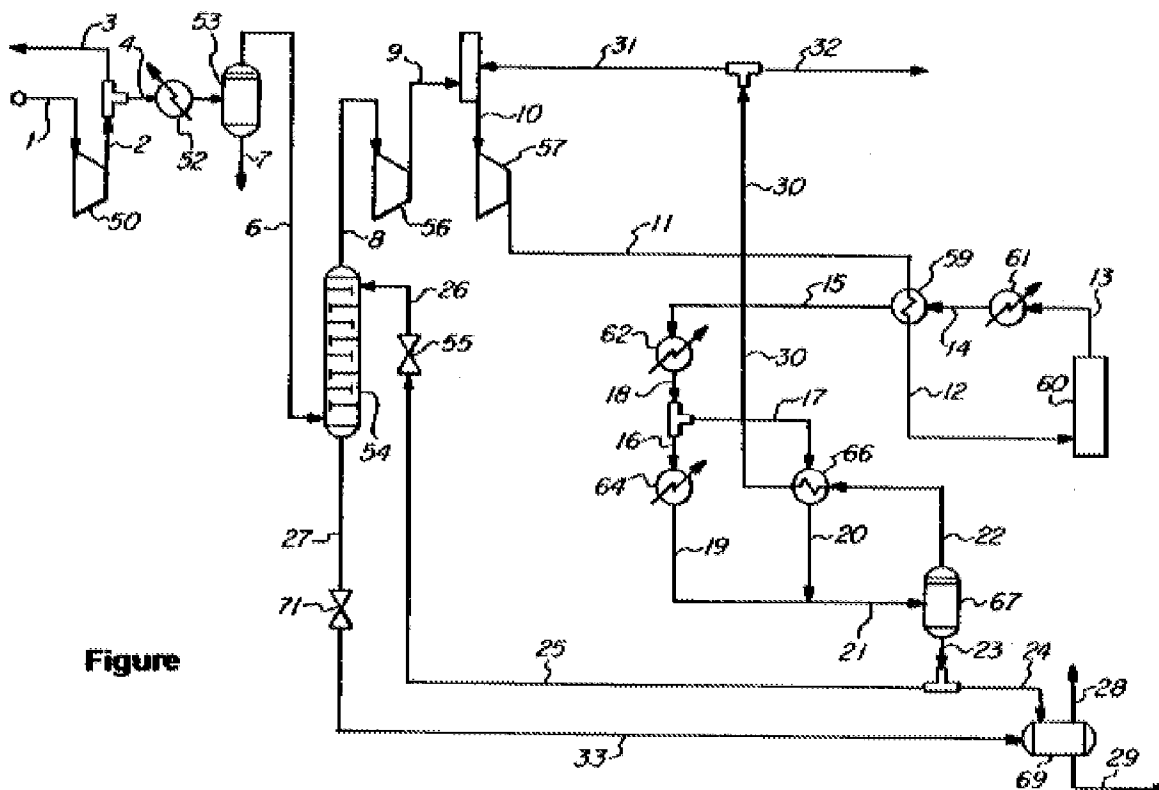
- (1). Applicant's Remarks filed on 6.2.2010 has been received.
The rejections of claims 1-10 in prior Office Action dated 12.2.2009 is sustained.

Claim Rejections - 35 USC § 103

The text of those sections of Title 35, U.S. Code not included in this action can be found in a prior Office action.

- (2). **Claims 1-10** are rejected under 35 U.S.C. 103(a) as being unpatentable over Moore (WO 01/66465A1) as applied to claim in view of Bendix et al "Results and Experiences on Revamping of Large-Scale Ammonia Single-Line Plants" , page 227, 1989, Torkilden et al (WO 99/13963), evidenced by Leverett (US 6019820A).

As to Method for ammonia production through a catalytic reaction of pressurized synthesis gas in an appropriate compressor with many stages, each of which is equipped with an inlet and outlet for synthesis gas, which method includes a purification step through liquid ammonia of synthesis gas from water and carbon dioxide contained in it in **independent claim 1**, Moore (WO 01/66465A1) discloses ammonia synthesis process and apparatus for use therein (Title). As illustrated in the following diagram, which include several stages of compression and inlet, outlet for each compressor, a dehydrator 54 with liquid ammonia from line 25 to contact synthesis gas from line 6 for purification, ammonia converter 60 (page 10, ln. 9-11).



As to step of arranging a gas-liquid mixer in fluid communication, on one side with the outlet of 1st stage of compressor or with the outlet of an intermediate stage thereof and having another side in fluid communication with the inlet of a further stage of compressor immediately following 1st stage or intermediate stage, mixer having an axially extending portion of decreasing cross section in a method in **independent claim 1**, Moore (WO 01/66465A1) discloses, stage of compressor 56, liquid ammonia stream 25, the dehydrator 54 to be one of any number of known gas-liquid contacting devices that bring gas and liquid phases into intimate contact with each other for the purpose of a diffusion exchange (page 9, line 7-9). Moore **does not teach** the gas-liquid mixer as claimed.

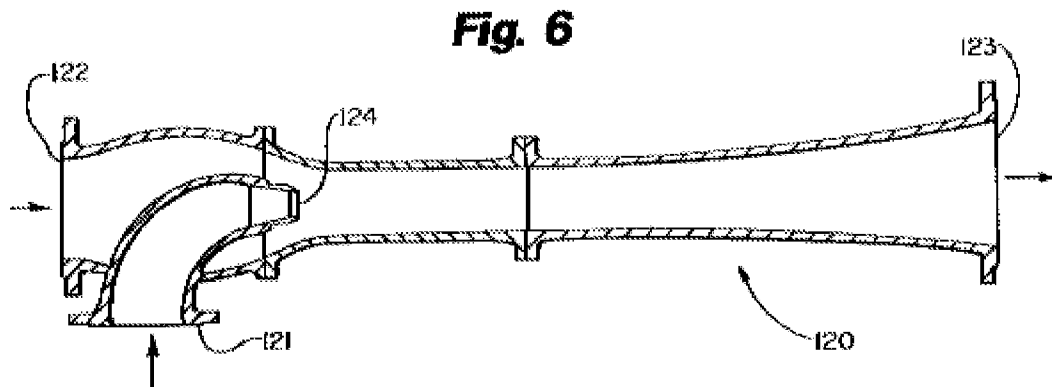
However, Bendix et al "Results and Experiences on Revamping of Large-Scale Ammonia Single-Line Plants"- page 227, last paragraph, **teach**, before coming to the additional reactor the make-up synthesis gas has to be dried by a technology developed by ACP together with

Chemoprojekt Prague. For that purpose, liquid ammonia is added to the gas from the discharge side of the 3rd stage of synthesis gas compressor in a Venturi tube.

The advantage of using Venturi mixing tube is to get a turbulent mixing to be intense and results in extremely efficient gas liquid contact. The mixing regime is preferably turbulent shear layer mixing. The liquid entrained in the gas may be in the form of droplets for gas continuous fluid phase distribution. The efficient mixing means that absorption can take place very rapidly and in a relatively small amount of solvent compared to that required in conventional absorption columns. This in turn means that the liquid duty in the equipment is dramatically reduced resulting in a consequential reduction in the size of any downstream regeneration section. At the same time, the mixing system used is simple and inexpensive compared to prior art systems, leading to reduced costs (page 2, line 10-23 as in Torkildsen).

Therefore, it would have been obvious at time of the invention to install Venturi tube and its downstream separator disclosed by Bendix et al for the dehydrator of Moore in order to attain the above-cited advantage. Moreover, the dehydrator disclosed by Moore is genus, the Venturi tube disclosed by Bendix et al is species, one of ordinary skills in the art would recognize that all species work well for genus, motivated by a reasonable expectation of success. *In re O'Farrell*, 853 F.2d 894, 903, 7 USPQ2d 1673, 1681 (Fed. Cir. 1988).

As to step of axially feeding into mixer a flow of synthesis gas outbound from 1st stage or from intermediate stage at the same time as a flow of liquid ammonia flows being coaxial and in co-current in method in **independent claim 1**, as illustrated in Figure 6 of Torkildsen et al (WO 99/13963), which reads on this limitation of instant claim.



As to step of creating a compression of such flow of reactant gases inside the mixer in **independent claim 1**, Torkildsen et al (WO 99/13963) disclose Fig.6 which shows a jet pump 120 comprising a 1st fluid inlet 121 for the high pressure fluid and a 2nd fluid inlet 122 for the low pressure fluid (page 10, line 6-15), in view of substantially identical liquid mixer disclosed by prior art and by Applicants, it appears that the compression by liquid on gases would be generated inherently. As it is evidenced by liquid jet compressor of Leverett (US 6019820).

As to step of separating substantially anhydrous synthesis gas from the mixture of flows outbound from mixer and sending gas into stage following 1st stage or intermediate stage in method in **independent claim 1**, both Figure 8 of Bendix et al and Figure 1 of Torkildsen et al disclose the separator downstream of the Venturi tube mixer.

(3). **Claims 2-10** are rejected under 35 U.S.C. 103(a) as being unpatentable over Moore (WO 01/66465A1) as applied to claim in view of Bendix et al "Results and Experiences on Revamping of Large-Scale Ammonia Single-Line Plants" , page 227, 1989, Torkildsen et al (WO 99/13963) for the same rationale recited in prior Office Action dated 7/16/2008.

Response to Arguments

(4). Applicant's arguments filed on 6.2.2010 have been fully considered but they are not persuasive.

Applicant's arguments focus on contention that the Venturi mixer of Bendix is improper for replacing the dehydrator 54 in process of Moore (WO 01/66465A1) because the Venturi mixer of Bendix is placed before the reactor, also Bendix is totally silent about the possibility of exploiting the pressure of the liquid ammonia flow in order to save energy for the synthesis gas compression, etc,. Thus any combination of Moore with Bendix would not arrive at the claimed method or apparatus (pages 2~3, Remarks).

However, Venturi tube mixer of Bendix is also used for dehydration by using liquid ammonia to absorb the water same as dehydrator 54 of Moore (WO 01/66465A1) and Moore (WO 01/66465A1) teaches any number of known gas-liquid contacting devices that bring gas and liquid phases into intimate contact with each other for the purpose of a diffusional exchange (page 9, ln. 7-9). The Venturi tube mixer not only generates turbulent mixing but also inherits

Art Unit: 1797

diffusional exchange (mechanism of removing water from gaseous stream into the liquid ammonia), turbulent mixing in Venturi tube mixer enhances the contacting, therefore increasing the diffusional exchange.

Secondly, although Venturi tube mixer of Bendix is placed before the additional reactor, not same configuration as claimed by Applicant, but the dehydrator of Moore (WO 01/66465A1) is placed at location similarly claimed by Applicant, the test for obviousness is not whether the features of a secondary reference may be bodily incorporated into the structure of the primary reference; nor is it that the claimed invention must be expressly suggested in any one or all of references. Rather, the test is what the combined teachings of the references would have suggested to those of ordinary skills in the art. *See In re Keller, 642 F.2d 413, 208 USPQ 871 (CCPA 1981)*.

Thirdly, Venturir tube mixer is operated in turbulent phase. Before contacting the gas phase, the liquid stream is pressurized by convergence of outlet as shown in the Figure 6 of Torkildsen et al (WO 99/13963), liquid jet is formed thereof, it already use the concept of increasing the pressure of liquid stream for contacting (higher than gas phase), compressing the gas phase inherently. So, the two fluids may not have same pressure at point of contact although Applicant asserted the substantially same pressure for both fluids at contact before being fed to the synthetic reactor. Moreover, mere Counsel's arguments unsupported by factual evidence are given little weight. *In re Lindner, 457 F.2d 506, 508, 173 USPQ 356, 358 (CCPA 1072)*.

Conclusion

THIS ACTION IS MADE FINAL. Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).

A shortened statutory period for reply to this final action is set to expire THREE MONTHS from the mailing date of this action. In the event a first reply is filed within TWO MONTHS of the mailing date of this final action and the advisory action is not mailed until after the end of the THREE-MONTH shortened statutory period, then the shortened statutory period will expire on the date the advisory action is mailed, and any extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of the advisory action. In no event, however, will the statutory period for reply expire later than SIX MONTHS from the mailing date of this final action.

Any inquiry concerning this communication or earlier communications from the examiner should be directed to IVES WU whose telephone number is (571)272-4245. The examiner can normally be reached on 8:00 - 5:00.

Art Unit: 1797

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Duane Smith can be reached on 571-272-1166. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

Examiner: Ives Wu

Art Unit: 1797

Date: July 20, 2010

/Duane Smith/
Supervisory Patent Examiner, Art Unit 1797